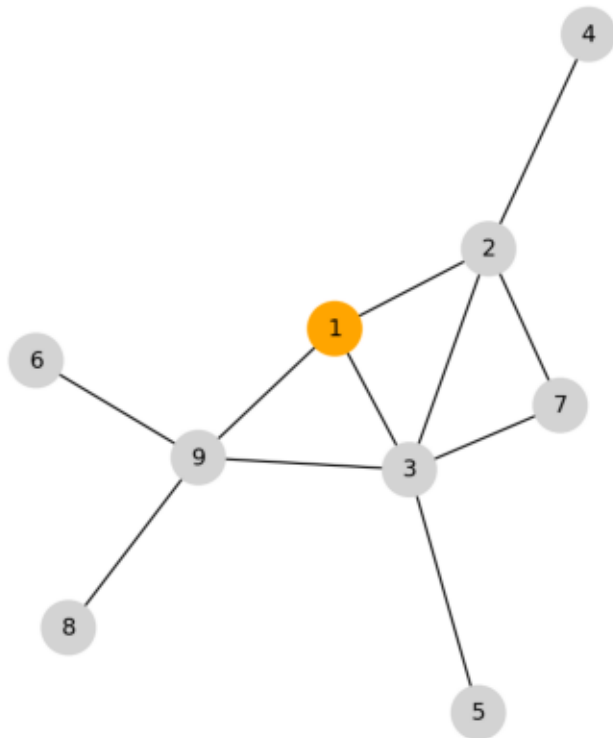


BFS Step 1



Event: Initialize: push 1, $\text{dist}[1]=0$

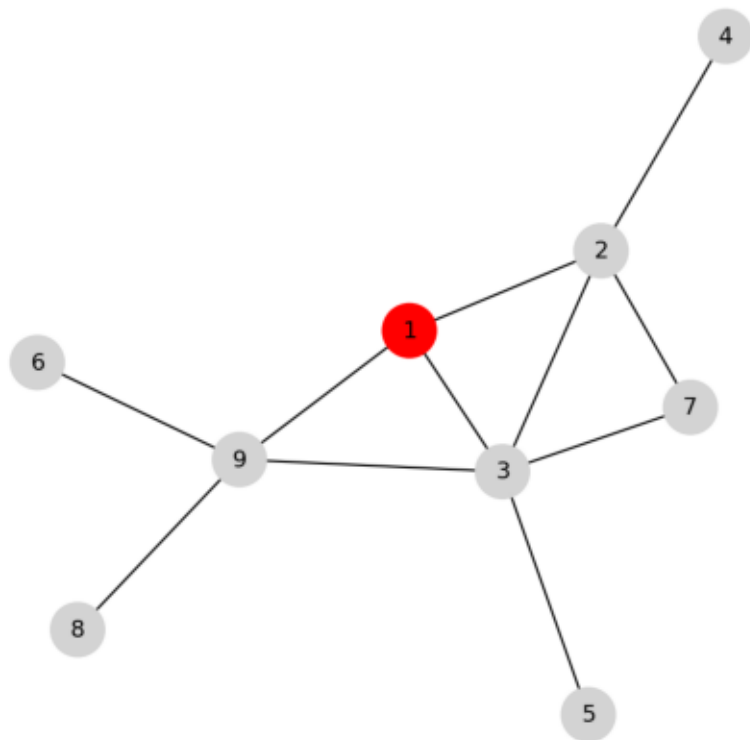
Current: None

Visited: [1]

Queue: [1]

dist: {1:0}

BFS Step 2



Event: Pop 1 from queue

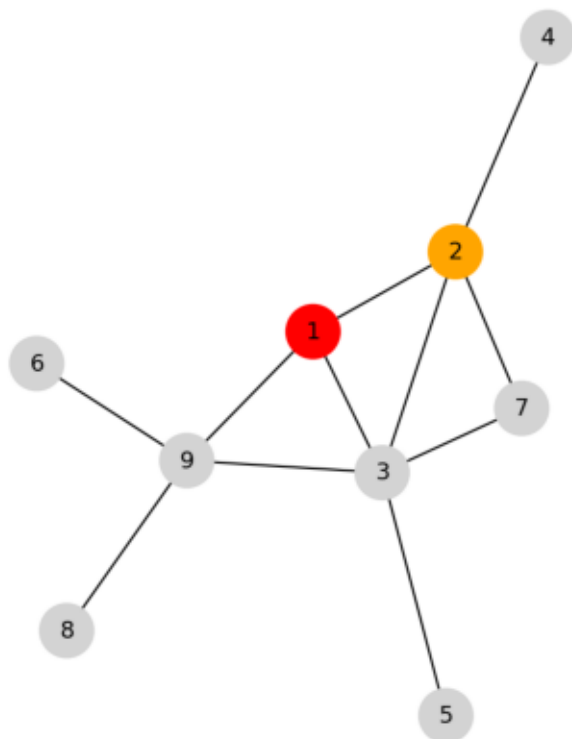
Current: 1

Visited: [1]

Queue: []

dist: {1:0}

BFS Step 3



Event: Discover 2: set $\text{dist}[2]=1$, push 2

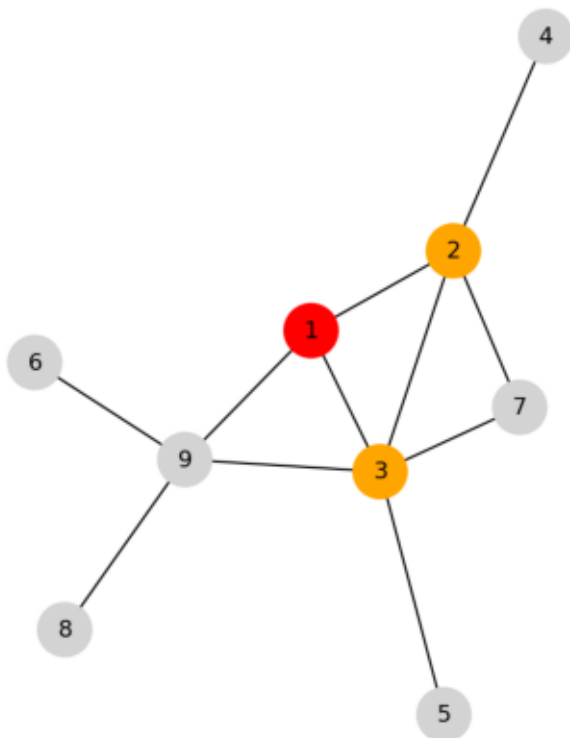
Current: 1

Visited: [1, 2]

Queue: [2]

dist: {1:0, 2:1}

BFS Step 4



Event: Discover 3: set $\text{dist}[3]=1$, push 3

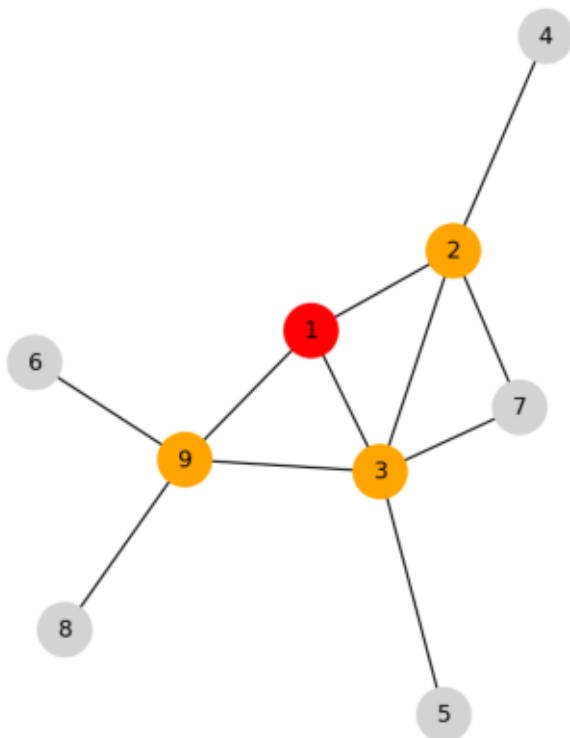
Current: 1

Visited: [1, 2, 3]

Queue: [2, 3]

dist: {1:0, 2:1, 3:1}

BFS Step 5



Event: Discover 9: set dist[9]=1, push 9

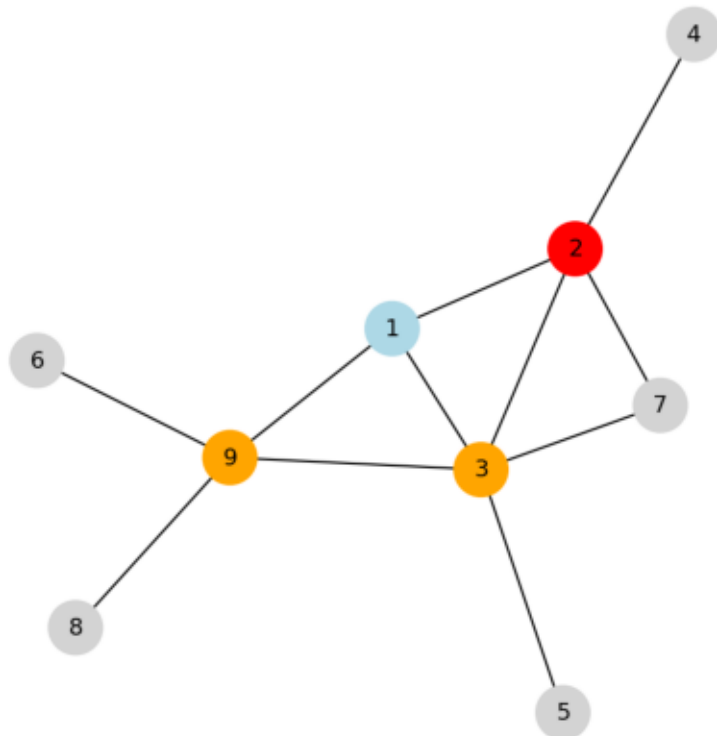
Current: 1

Visited: [1, 2, 3, 9]

Queue: [2, 3, 9]

dist: {1:0, 2:1, 3:1, 9:1}

BFS Step 6



Event: Pop 2 from queue

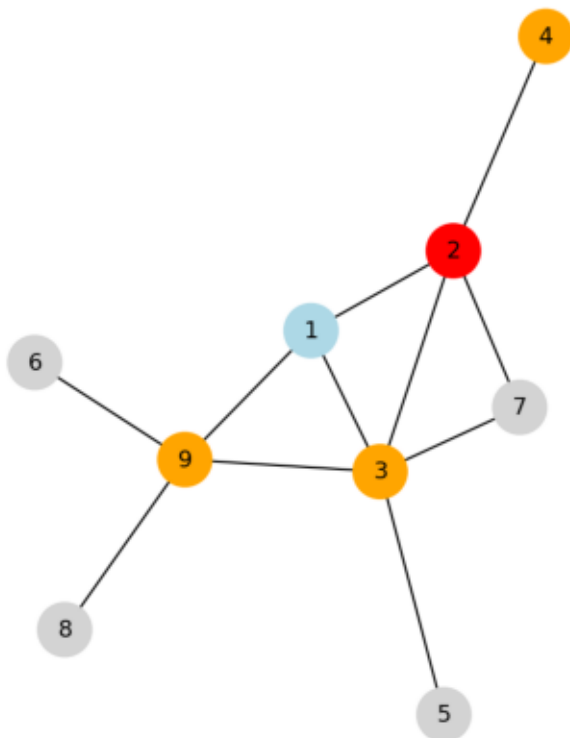
Current: 2

Visited: [1, 2, 3, 9]

Queue: [3, 9]

dist: {1:0, 2:1, 3:1, 9:1}

BFS Step 7



Event: Discover 4: set $\text{dist}[4]=2$, push 4

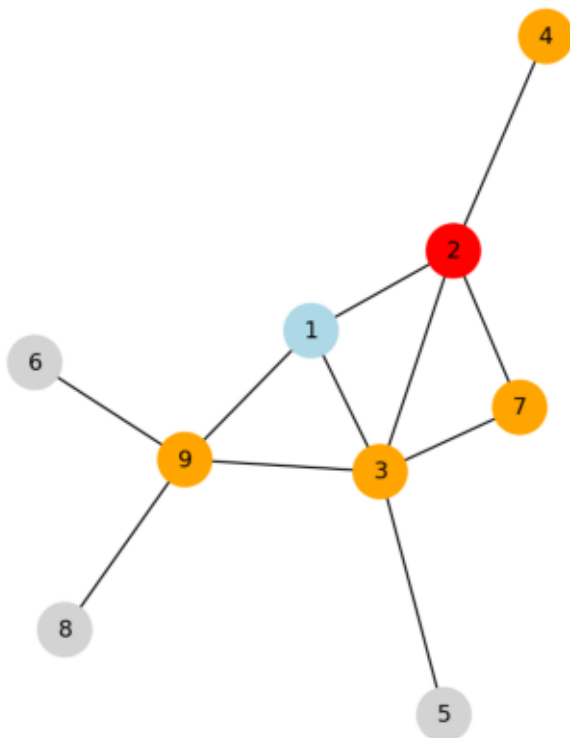
Current: 2

Visited: [1, 2, 3, 4, 9]

Queue: [3, 9, 4]

dist: {1:0, 2:1, 3:1, 4:2, 9:1}

BFS Step 8



Event: Discover 7: set $\text{dist}[7]=2$, push 7

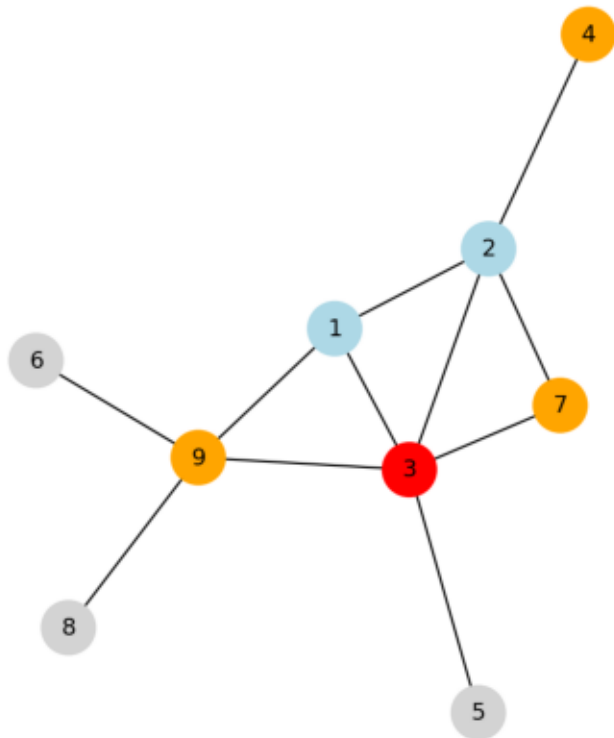
Current: 2

Visited: [1, 2, 3, 4, 7, 9]

Queue: [3, 9, 4, 7]

dist: {1:0, 2:1, 3:1, 4:2, 7:2, 9:1}

BFS Step 9



Event: Pop 3 from queue

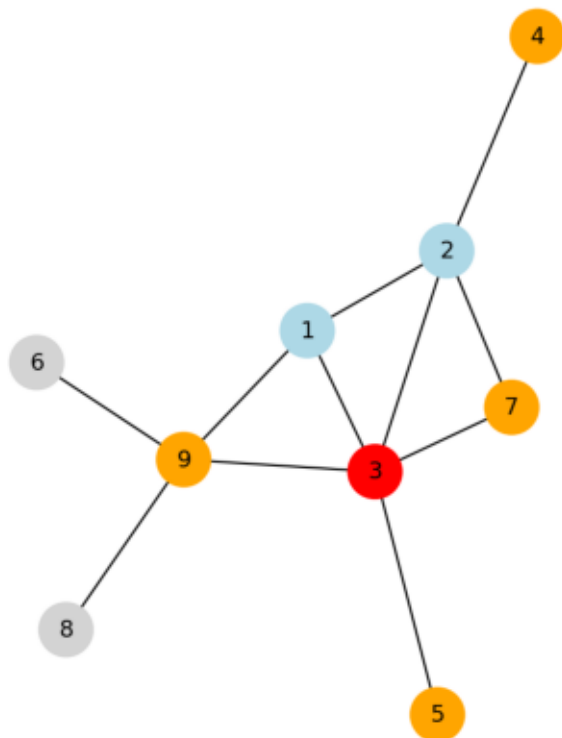
Current: 3

Visited: [1, 2, 3, 4, 7, 9]

Queue: [9, 4, 7]

dist: {1:0, 2:1, 3:1, 4:2, 7:2, 9:1}

BFS Step 10



Event: Discover 5: set $\text{dist}[5]=2$, push 5

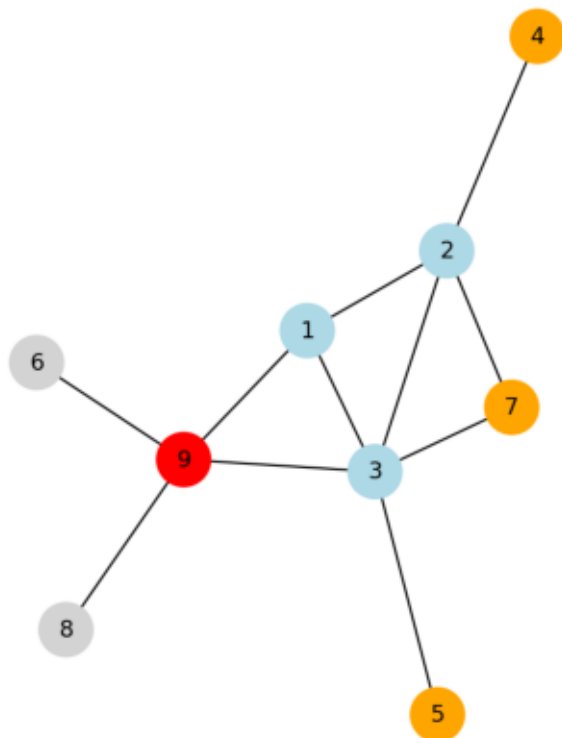
Current: 3

Visited: [1, 2, 3, 4, 5, 7, 9]

Queue: [9, 4, 7, 5]

dist: {1:0, 2:1, 3:1, 4:2, 5:2, 7:2, 9:1}

BFS Step 11



Event: Pop 9 from queue

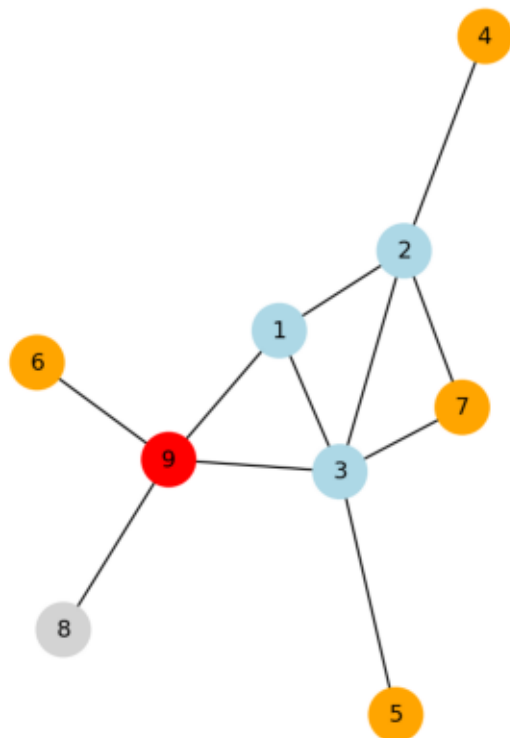
Current: 9

Visited: [1, 2, 3, 4, 5, 7, 9]

Queue: [4, 7, 5]

dist: {1:0, 2:1, 3:1, 4:2, 5:2, 7:2, 9:1}

BFS Step 12



Event: Discover 6: set $\text{dist}[6]=2$, push 6

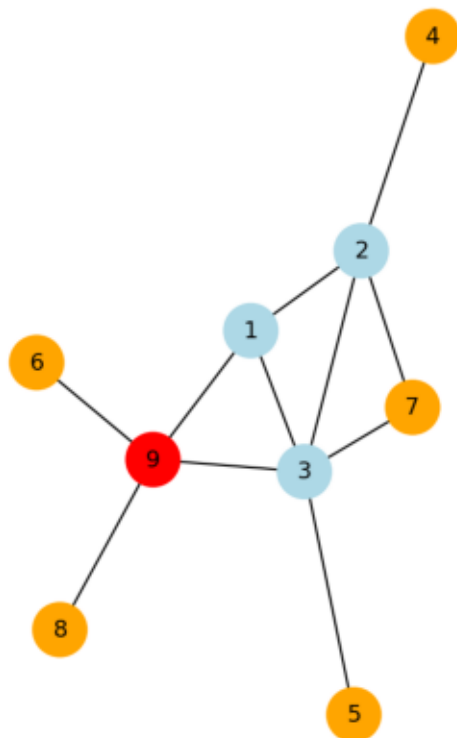
Current: 9

Visited: [1, 2, 3, 4, 5, 6, 7, 9]

Queue: [4, 7, 5, 6]

dist: {1:0, 2:1, 3:1, 4:2, 5:2, 6:2, 7:2, 9:1}

BFS Step 13



Event: Discover 8: set $\text{dist}[8]=2$, push 8

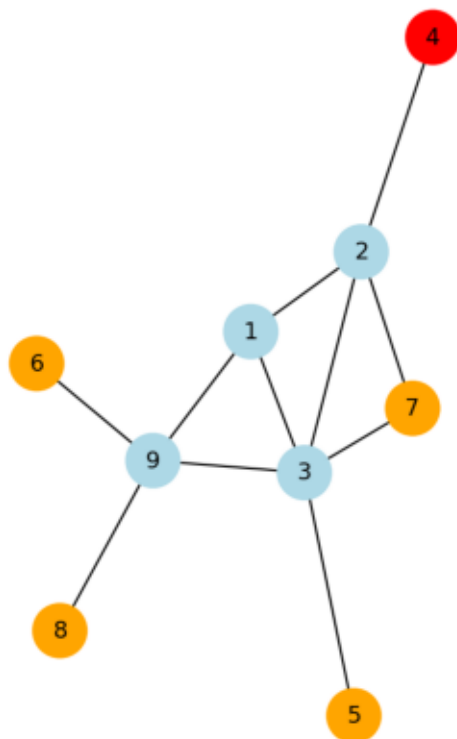
Current: 9

Visited: [1, 2, 3, 4, 5, 6, 7, 8, 9]

Queue: [4, 7, 5, 6, 8]

dist: {1:0, 2:1, 3:1, 4:2, 5:2, 6:2, 7:2, 8:2, 9:1}

BFS Step 14



Event: Pop 4 from queue

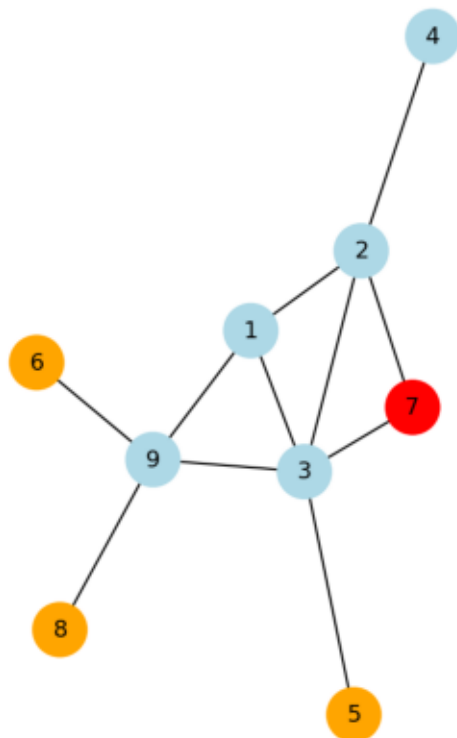
Current: 4

Visited: [1, 2, 3, 4, 5, 6, 7, 8, 9]

Queue: [7, 5, 6, 8]

dist: {1:0, 2:1, 3:1, 4:2, 5:2, 6:2, 7:2, 8:2, 9:1}

BFS Step 15



Event: Pop 7 from queue

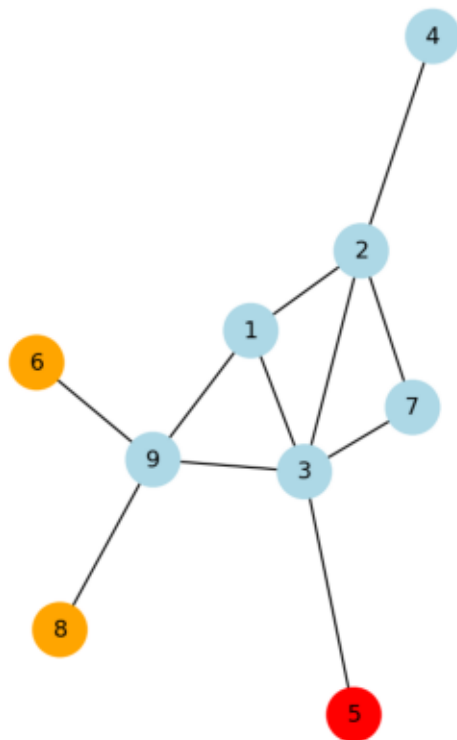
Current: 7

Visited: [1, 2, 3, 4, 5, 6, 7, 8, 9]

Queue: [5, 6, 8]

dist: {1:0, 2:1, 3:1, 4:2, 5:2, 6:2, 7:2, 8:2, 9:1}

BFS Step 16



Event: Pop 5 from queue

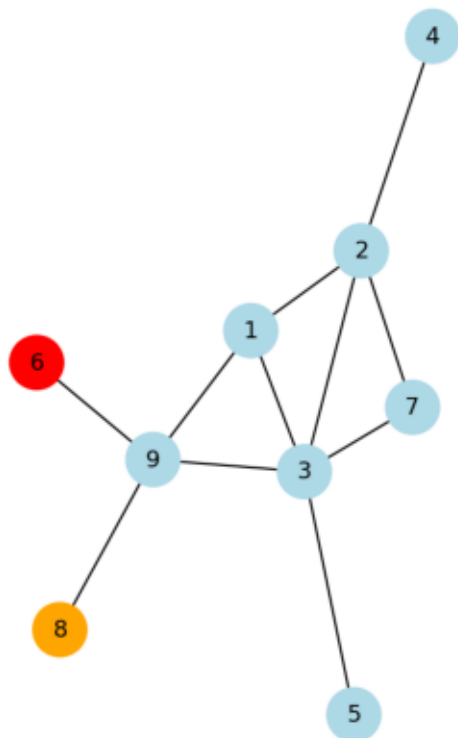
Current: 5

Visited: [1, 2, 3, 4, 5, 6, 7, 8, 9]

Queue: [6, 8]

dist: {1:0, 2:1, 3:1, 4:2, 5:2, 6:2, 7:2, 8:2, 9:1}

BFS Step 17



Event: Pop 6 from queue

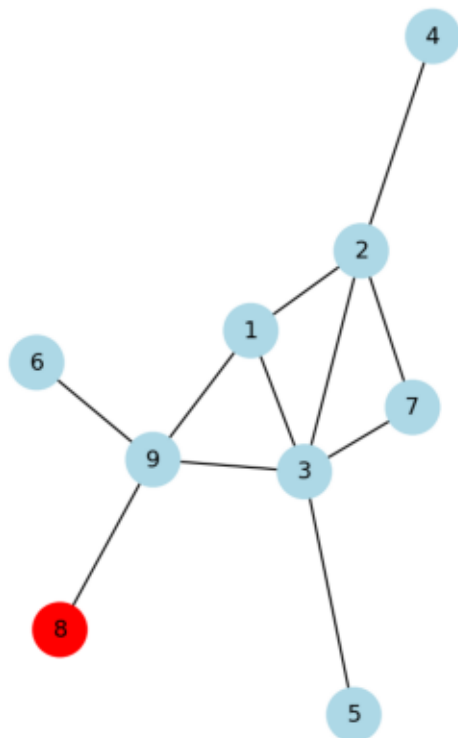
Current: 6

Visited: [1, 2, 3, 4, 5, 6, 7, 8, 9]

Queue: [8]

dist: {1:0, 2:1, 3:1, 4:2, 5:2, 6:2, 7:2, 8:2, 9:1}

BFS Step 18



Event: Pop 8 from queue

Current: 8

Visited: [1, 2, 3, 4, 5, 6, 7, 8, 9]

Queue: []

dist: {1:0, 2:1, 3:1, 4:2, 5:2, 6:2, 7:2, 8:2, 9:1}